

FEASIBILITY STUDY

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US 19
Through the Nantahala Gorge
Macon-Swain Counties
R-0000

Prepared by
Planning and Research Branch
Division of Highways
N. C. Department of Transportation

July, 1987

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Through the Nantahala Gorge
Macon-Swain Counties
R-0000

The subject project is not included in the 1987-1995 Transportation Improvement Program, but a study has been requested as to the feasibility of using the Southern Railway right-of-way through Nantahala Gorge for the construction of a two lane highway.

I. GENERAL DESCRIPTION

The proposed project would make use of the existing Southern Railway roadbed to construct a two lane highway through Nantahala Gorge.

The existing highway through the Gorge is 20' wide with 6' shoulders. The right-of-way width ranges from 60' to 100'. The alignment is poor with numerous sharp curves and steep grades. The highway is in very close proximity to the Nantahala River from Wesser to the point where it crosses the river at SR 1101. The shoulder on the river side of the highway is extremely narrow along most of this section of US 19. The opposite side of the highway is bordered by very steep cut banks for most of the length of this section.

For the purposes of this study the section of the railroad from near Wesser (railroad milepost 79+) to SR 1101 (railroad milepost 85+) has been selected as this is the section closest to the river and therefore is most critical to this study. For the balance of US 19 between NC 28 and the Andrews Bypass, improvements could probably be made to the existing highway without using the railway roadbed. The length of the railroad roadbed addressed in this study is approximately 5.5 miles.

The railway roadbed in this area is in very close proximity to the Nantahala River. The outside rail is in many places only 4' to 5' from the edge of the river bank. Measurements at several points along the railroad indicate that the average width of the railway bed cut is 25' to 30'. The opposite side of the railway bed is bordered by very steep cut banks. At several locations along this section the railroad company has built retaining walls to prevent the railbed from sliding into the river.

Use of the railroad bed for the construction of a two lane highway through the Nantahala Gorge appears to be neither feasible nor desirable for both environmental and geological reasons.

II. ENVIRONMENTAL PROBLEMS

Several years ago a Final Environmental Impact Statement (projects A-8 and A-9) was approved for construction of a new section of US 19 from the Andrews Bypass to near the Little Tennessee River. One of the alternatives considered during this study was the four laning of existing US 19 through the Nantahala Gorge. Reactions to this

alternative from Federal, state and local agencies and from private conservation and environmental organizations were almost unanimously in opposition to any construction within the Gorge. The U. S. Department of the Interior classified this alternative's impact on the Gorge as ranging from "severe" to disastrous." The U. S. Forest Service called any widening of the highway through the Gorge as unacceptable. All of the private organizations objected to any construction in the Gorge and many of them objected to any construction at all in the vicinity of the Gorge. It can be assumed that these same objections would apply to use of the railbed since probable environmental impacts would be as severe or more severe.

As a part of this study the Geotechnical Unit was requested to do a field reconnaissance of this area within the Gorge as the previous study had indicated that slope stability would be a problem within the Gorge. The results of this field survey are contained in a report in the Appendix. The conclusion of this reconnaissance was that a great potential exists for slope stability problems on the west side of the gorge. In addition, the narrow width of the railbed would require extensive cuts into the mountainside, filling encroachments in portions of the river, construction of retaining walls and guardrails and possibly some tunneling. This would be required for even a minimal two lane road.

The Nantahala River is very popular for whitewater canoeing and rafting. The area is very scenic and is a popular tourist attraction. Proposing of any highway construction work in this area could be expected to arouse great opposition and holds a high probability of extensive litigation.

Another environmental problem in addition to those discussed above is the presence of threatened or endangered species in the area.

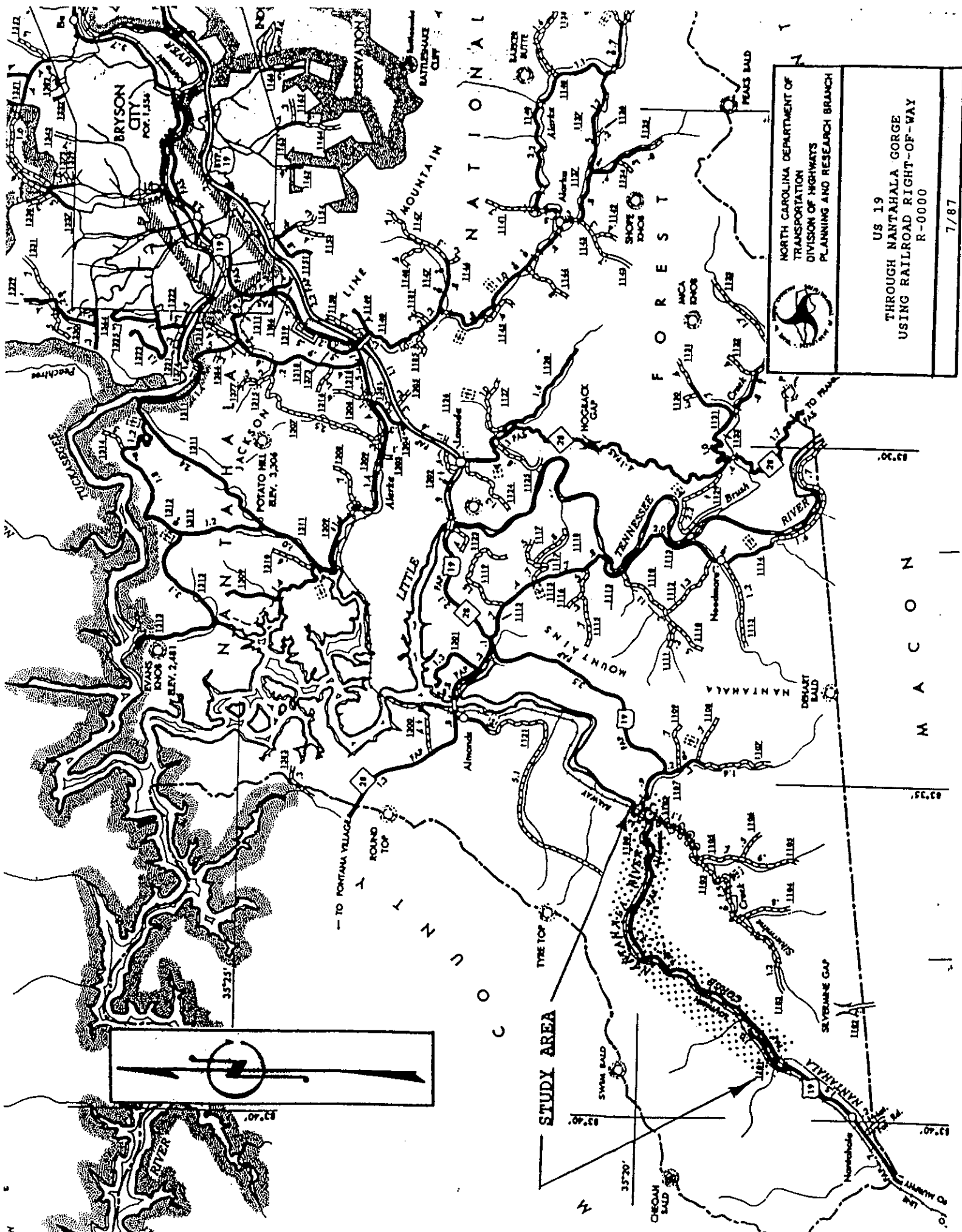
In conclusion, construction of a two lane highway using the railroad right-of-way is not considered to be feasible or practical for the above discussed reasons.


III. SCOPE OF STUDY

No cost estimates were requested as it was felt that they were not necessary for this study and because this study is not included in the Transportation Improvement Program.

Conclusions on this study were based on experience with the planning for projects A-8 and A-9 and from consultations with the Geotechnical Unit. Resources included the Final Environmental Impact Statement for projects A-8 and A-9, county maps, quad sheets and field investigations.

ASC/sdt



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|  | NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PLANNING AND RESEARCH BRANCH | |
| | US 19 THROUGH NANTAHALA GORGE USING RAILROAD RIGHT-OF-WAY R-0000 | |
| | | 7/87 |

APPENDIX

June 5, 1987

STATE PROJECT: N/A
TIP NO.: R-0000
COUNTY: Swain-Macon
DESCRIPTION: US 19, Nantahala Gorge

MEMORANDUM TO: Mr. C. D. Adkins, Manager
Planning and Research Branch
Attention: Mr. A. S. Cline, Jr.

FROM: *W. D. Bingham*
W. D. Bingham, State Engineering Geologist

SUBJECT: Geotechnical Project Reconnaissance and Feasibility Study

As requested by A. S. Cline, we have made a field reconnaissance of a portion of the subject project relative to constructing a one-way pair of roads using the existing railroad bed for the south bound lanes and existing US 19 for the north bound lanes. It is our understanding that the entire proposed project would extend between Topton, Macon County and Wesser, Swain County.

The studied segment lies between Hewitt (river mile 10) and river mile post 7, west of Wesser, a distance of 3 miles. This is the deepest and narrowest part of the Nantahala Gorge. Elevation differences between the bottom of the gorge and the adjacent mountains range between 1050 and 1350 feet. The sides of the gorge rise at steep angles of 28° to 33°. The stream gradient of the Nantahala River ranges between 0.36% and 1%, causing it to be very turbulent and frothy (white water). Through this very narrow gorge both the railroad and the highway are partly cut into the mountain slope or built on partial embankments along the river banks. The slopes and toes of the embankments have been protected with rip rap against scour action.

Geologically the area is composed of metamorphic rocks of the Murphy Belt, including the Murphy Marble, Nantahala and Mineral Bluff Formations. Talc Mountain at Hewitt is being quarried for the production of aggregate. The Nantahala Gorge generally follows the "Mary King Mountain Fault", a major thrust fault and structural geologic lineament in the Great Smokey Mountain Range. Within the Murphy Marble, caves have formed along the joint system. Some of these caves are of considerable size and extent. The attitude of the rock formations is generally described by a SW-NE strike and variable southeasterly dips. This situation bears a great potential for slope stability problems on the west side of the gorge. The mountain slopes are mostly covered with

Mr. C. D. Adkins, Manager
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colluvium, loose and incoherent deposits of soil, rock waste and boulders. There are numerous indications of slope failures and rock fall.

Assessment

A four lane highway facility between Tipton and Wesser, a distance of approximately 10 miles, will be reasonably located through the Nantahala Gorge and should utilize as much as possible existing highway and railroad alignments. Conventional design and construction procedures would mostly be applicable for about 70% of the length of the project. Between Tipton and Beechertown, the project would consist of widening the existing roadway to the desired four lane section. Major geotechnical problems are not anticipated. Between Beechertown and Hewitt (river mile 10), roadway improvements could utilize the existing highway or railroad alignment or both without major problems to optimize design and construction. Between river mile 10 and 7 lies the narrowest part of the gorge. Both the topographic and geologic conditions are confining and limiting in respect to this project. The railroad bed on the west side of the river is very narrow, sometimes not wider than 12 feet between the shoulder of the river bank and the toe of the mountain slope. To convert the railroad alignment to a roadway with a minimum typical section width of 50 feet would require considerable cuts into the mountain side, fill encroachments on the Nantahala River, extensive retaining structures and possibly tunneling. In view of these adverse condition, the use of the existing roadway alignment on the right bank of the river would reduce the degree of difficulty somewhat. Because of the more favorable attitude of the rock (dipping into the mountain) slopes can be designed with steeper angles (1:1 or steeper) and are likely to be more stable. In several segments the river bank is wider and will better accommodate a four lane roadway. There will be fewer retaining structures (if any) required and fill encroachment on the river should be much less compared to the west bank. Between river mile 7 and 8, the Nantahala River turns eastward towards Wesser and the gorge widens, lessening the problems of widening and or building additional roadway lanes.

If we can be of further assistance, please advise.

WDB/HFK/kw

Attachment

cc: Mr. P. W. Winchester